R E P O R T R E S U M E S

ED 013 457 CG 000 655

STUDENTS WITH DIFFERENT VOCATIONAL CHOICES. A DESCRIPTION OF COLLEGE FRESHMEN, II.

BY- ABE, CLIFFORD HOLLAND, JOHN L.
AMERICAN COLLEGE TESTING PROGRAM, IOWA CITY, IOWA

REPORT NUMBER ACT-RR-NO-4-JUN-65 PUB DATE JUN 65
EDRS PRICE MF-$0.25 HC-$2.16 54P.

DESCRIPTORS- *COLLEGE FRESHMEN, *CAREER CHOICE, *STUDENT CHARACTERISTICS, *STUDENT EVALUATION, RESEARCH, VOCATIONAL COUNSELING, VOCATIONAL INTERESTS, UNITS OF STUDY (SUBJECT FIELDS), AMERICAN COLLEGE SURVEY

THE AMERICAN COLLEGE SURVEY WAS USED TO ASSESS 12,432 COLLEGE FRESHMEN FROM 31 INSTITUTIONS ON 43 SCALES. FOR EACH VOCATION SELECTED BY 10 OR MORE STUDENTS, THE MEAN AND STANDARD DEVIATION WERE COMPUTED FOR 117 STUDENT CHARACTERISTICS. THE VOCATIONS WERE CATEGORIZED INTO 13 AREAS, AND SUMMARIES OF STUDENT CHARACTERISTICS IN EACH AREA WERE PREPARED. THE DESCRIPTIONS OF STUDENTS SEEKING DIFFERENT VOCATIONS IMPLY THAT/ (1) STUDENTS SEEK VOCATIONS WHICH ARE APPROPRIATE FOR THEIR INTERESTS, VALUES, AND SPECIAL TALENTS, (2) VOCATIONAL DECISIONS DEPEND UPON MANY STUDENT CHARACTERISTICS, (3) THE REPORT MAY BE VALUABLE TO STUDENTS WHO CANNOT USE THE SERVICES OF GUIDANCE WORKERS, AND (4) THERE IS PROBABLY A CLOSE ASSOCIATION BETWEEN THE CHOICE OF MAJOR FIELD AND CHOICE OF VOCATION. THE PRESENT STUDY MAY BE LIMITED BY THE FACT THAT THE STUDENTS ARE ASPIRANTS, RATHER THAN EMPLOYEES, IN THE VARIOUS VOCATIONS. FURTHER RESEARCH EFFORTS ARE PLANNED TO/ (1) DEVELOP PSYCHOLOGICAL CLASSIFICATION SCHEMES, (2) LEARN HOW STUDENTS WHO PERSIST IN A FIELD DIFFER FROM THOSE WHO LEAVE IT, (3) DETERMINE THE PREDICTIVE VALIDITIES OF THE ASSESSMENT DEVICES USED IN THIS STUDY, AND (4) DETERMINE THE INFLUENCE OF COLLEGE CLIMATES UPON A STUDENT'S VOCATIONAL CHOICE. THIS DOCUMENT IS AN ACT RESEARCH REPORT, NO. 4, JUNE 1965. (PR)

ED013457

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ACT

RESEARCH REPORTS

A DESCRIPTION OF COLLEGE FRESHMEN:

II. STUDENTS WITH DIFFERENT VOCATIONAL CHOICES

June, 1965 No. 4

Clifford Abe
John L. Holland

Published by Research and Development Division • American College Testing Program • P. O. Box 168, Iowa City, Iowa 52240

A Description of College Freshmen: II. Students with Different Vocational Choices

Clifford Abe and John L. Holland

Despite several decades of interest in vocational decisions, the description of people aspiring to or employed in various vocations is still insufficient for educational and vocational guidance and for research. The present study describes college freshmen preparing for different vocations. We have assumed that these descriptions of prospective recruits have the following desirable properties: First, the descriptive variables, which are generally the product of simple, direct assessments of student characteristics, are easily interpreted by students, counselors, and faculty. And secondly, since most descriptions of single vocations and groups of vocations are based on large national samples of college students, the results are generally reliable and more universal in nature.

The student sample and the assessment devices used in this study, which are explained in the following section, The Student Survey, are the same as those used in an earlier study, A Description of College Freshmen: I. Students with Different Choices of Major Field (Abe & Holland, 1965). The analysis of the data in both studies is similar. If you have read the earlier descriptive study of major fields, you may omit this next section, since it merely reiterates what you have learned

earlier, and go to the section, Vocations and Their Prospective Recruits, on page 11. If you have not read the earlier report, or if you do not remember clearly the scales involved in the survey, you should read the next section, so you can more readily understand the rest of the report.

The Student Assessment

The present study grew out of the American College Survey (Abe, Holland, Lutz, & Richards, 1965), a project conducted by the American College Testing Program to obtain a more complete account of the typical American college student and of the variation among students from college to college. To accomplish these tasks, a comprehensive assessment was given to 12,432 college freshmen at 31 institutions of higher education in the spring of 1964. The following sections describe the student sample, the materials, and the scales contained in the student survey.

The Student Sample

Table 1 names the colleges that participated in the project, the number of students at each of these colleges, and the rate of participation for each college. This table shows that students in coeducational colleges are somewhat over-represented and that students in West Coast colleges are considerably under-represented. However, the over-all impression given by this table is that a reasonable cross-section of American college freshmen in 1964 was attained.

The number of freshmen and the percentage of the freshman class

Table 1

The Participating Colleges and the Percentage of Freshmen Who Responded to the American College Survey

College	State	Men	Women	% of Total Fresh. Class
Arkansas Polytechnic College	Arkansas	155	94	34
Baylor University	Texas	207	273	44
Black Hills Teachers College	South Dakota	102	74	46
Bloom Township Community College	Illinois	102	46	70
Burlington Community College	Iowa	135	72	96
California State College at Hayward	California	144	186	60
Carthage College	Wisconsin	33	89	44
Colorado State College	Colorado	62	172	22
Fairmont State College	West Virginia	187	152	76
Glassboro State College	New Jersey	178	529	80
Indiana State College	Indiana	233	333	28
Jamestown Community College	New York	77	83	64
Kansas State University	Kansas	641	511	73
Lyons Township Junior College	Illinois	50	53	57
Mount Mercy College	Pennsylvania	--	150	91
New Mexico State University	New Mexico	198	81	29
Plymouth State College	New Hampshire	59	115	72
Snow College	Utah	82	63	49
Southeastern State College	Oklahoma	143	107	62
Southern Connecticut State College	Connecticut	147	398	77
Southern Illinois University	Illinois	762	363	33
Springfield College	Massachusetts	145	85	54
Swarthmore College	Pennsylvania	69	50	44
University of Alabama	Alabama	429	387	43
University of Kentucky	Kentucky	711	616	63
University of North Dakota	North Dakota	226	272	49
University of Tennessee	Tennessee	597	474	47
Wesleyan University	Connecticut	287	--	94
Westbrook Junior College	Maine	--	169	81
William Carey College	Mississippi	30	47	47
William Jewell College	Missouri	98	99	81
Total Students		6289	6143	

participating in the American College Survey varied greatly from college to college. At one extreme, 94 per cent of the Burlington Community College freshmen participated, while at the other, Colorado State College submitted a selected sample of 22 per cent of their freshmen. The rate of participation in most instances was quite satisfactory.

The Student Survey

The American College Survey (1964), the device used to assess the various student characteristics, is a booklet which contains a letter explaining the purpose of the survey, and 1004 items which are concerned with such orientations as a student's interests, potential for various kinds of achievement, and attitudes. The following sections summarize our knowledge of the scales and assessment devices contained in the American College Survey.

Vocational Preference Inventory (Fifth Revision). This personality and interest inventory is composed entirely of occupational titles (Holland, 1958). To take the inventory, a student indicates which occupations he likes and dislikes. Scores on only the following scales were used for this study: Realistic, Intellectual, Social, Conventional, Enterprising, Artistic, Self-Control, Aggressive, Masculine, Status, and Acquiescence. Reliabilities (Kuder-Richardson 20) ranged from .57 to .89 for 6289 male college freshmen and from .50 to .89 for 6143 females. For the present descriptive study, it is useful to interpret the VPI as an inventory of vocational interests. The VPI scales used and their "interest" interpretations are as follows:

Scale	Preference for:
Realistic	technical and skilled trades
Intellectual	scientific occupations
Social	teaching and helping occupations
Conventional	clerical occupations
Enterprising	supervisory and sales occupations
Artistic	artistic, musical, and literary occupations
Self-Control	aversion to occupations involving risk of physical injury, adventure, and danger
Aggressive	occupations of great power and status such as UN Diplomat, College President, Prosecuting Attorney
Masculine	occupations typical of men
Status	prestigeful occupations such as Lawyer, Doctor, Business Executive
Acquiescence	number of preferred occupations

Potential Achievement Scales. In an earlier study of National Merit Finalists (Holland & Nichols, 1964), Potential Achievement Scales were constructed empirically by sex for the prediction of six kinds of extracurricular achievement: art, music, writing, science, dramatics, and leadership. The students falling in the upper and lower 27 per cent on checklists of accomplishments for these fields in high school indicated their preferences for 273 daily activities, hobbies, reading habits, school subjects, and sports. Typical items included working on guns,

building scientific equipment, playing chess, going to a public library, giving talks, collecting rocks, playing charades, and drawing cartoons. In the first study of these scales only the 15 most discriminating items were used, and item-criterion correlations ranged from .24 to .80. In the present study, all scales were lengthened by adding from 3 to 14 items per scale. These additions were intended to increase the reliability and perhaps the validity of the Potential for Achievement Scales. The lengthened scale reliabilities (Kuder-Richardson) ranged from .77 to .87 for men and from .72 to .85 for women.

Extracurricular Achievement Record. The checklists of extracurricular accomplishment for the high school years were used earlier by Holland and Nichols (1964) and include the following areas: art, music, literature, dramatic arts, leadership, and science. The score on each scale is simply the number of accomplishments checked. Students with high scores on one or more of these scales have attained a high level of accomplishment, characterized by complex skills, persistence, and originality. The reliabilities (K-R 21) for individual records of accomplishment range from .48 to .75 for men and from .58 to .86 for women for National Merit Finalists. In a diverse group of college freshmen, the reliabilities (K-R 20) ranged from .72 to .84 for men and from .65 to .81 for women.

Preconscious Activity Scale. This scale is an a priori scale developed to measure Kubie's (1958) notion of preconscious activity as a process in creative performance (Nichols & Holland, 1963). The

Preconscious Activity Scale is a 38-item true-false scale with reliabilities (K-R 20) of .72 and .68 for male and female college freshmen. The predictive and concurrent validities of this scale with originality and interest measures imply that the Preconscious Activity Scale should be interpreted as an originality measure, especially in the fields of art, literature, and music (Nichols & Holland, 1963).

Range of Competencies. From a list of 143 activities, students checked those they could do well or competently. These scales assume that a large number of abilities contributes to achievement generally and abilities in a particular field contribute to achievement in that field. Typical items from this list included: I have a working knowledge of Robert's Rules of Order, I can dance, I am a good cook, I can make jewelry, I can read blueprints, I can read Greek, I can operate a tractor, I can use logarithm tables, etc. The number of activities checked equals a student's range of competencies. Three judges categorized the items into several areas of competence: scientific, technical, governmental, athletic, business, social and educational, homemaking, arts, leadership and sales, and foreign language. Students were then scored for each kind of competency. The reliability (K-R 20) for the total number of competencies claimed was .94 and .93 for male and female college freshmen; the reliabilities for the special competency scales ranged from .35 to .87 and from .11 to .85 for men and women. The very low reliabilities for a few scales probably result from the small number of items in such scales.

Interpersonal Competency Scale. This a priori scale of twenty

items was modeled after the work of Foote and Cottrell (1955). Having defined interpersonal competence as "acquired ability for effective interaction," they outlined a program of research to study this concept. Scale items simply poll the subject for those factors which Foote and Cottrell believe to be conducive to, or typical of interpersonal competency--good health, social experience, social competencies, positive self-regard. The reliability (K-R 20) of the Interpersonal Competency Scale for groups of 6289 male and 6143 female college freshmen was .69 and .67 respectively.

Range of Experience. The assumption underlying the development of this scale is that breadth of experience contributes to achievement. Students checked their experiences from a list of 76 items. Typical examples included: museum, factory, gambling casino, summer camp, mental hospital, sports car race. The score on this scale is the number of experiences checked. The reliability (K-R 20) was .92 and .90 for male and female college freshmen.

Intellectual Resources in the Home. The underlying assumption of this scale is that many environmental resources contribute to achievement. From a list of 39 items, students checked those found in their homes. Typical items included: an encyclopedia set, a tape recorder, sculpturing tools, a sewing machine, power tools, a library of more than 200 books. The number of items checked is the score. The reliability (K-R 20) of this scale was .81 for male college freshmen and .78 for female college freshmen.

Dogmatism Scale. This scale, developed by Rokeach (1956) to measure dogmatic and rigid thinking, consists of 40 true-false items concerned with beliefs and attitudes. (The first version by Rokeach is in multiple choice form.) The reliability (K-R 20) for 6289 male college freshmen was .77 and for 6143 female college freshmen was .75.

Student Orientation Survey, Form C. Farber and Goodstein (1964) developed four a priori scales to assess the student orientations implied in Trow's student typology (1960). These scales are Academic, Collegiate, Non-conforming, and Vocational. The a priori scales were revised by an internal consistency item analysis to develop homogeneous, 10-item scales. Reliabilities (K-R 20) ranged from .39 to .45 for male college freshmen and from .36 to .50 for females.

Other Descriptive Information. Students were polled for such background information as their educational and economic aspirations, their life goals, and their self-ratings. They were asked to indicate their choice of vocation and field of training. Their high school grades and ACT scores were available from college records. Students indicated whether 35 different life goals and achievements (such as, being a religious person, making a contribution to scientific knowledge, being happy and content) were "essential, very important, somewhat important, or of little importance" to them. Using a list of 31 traits and abilities, such as originality, scholarship, and conservatism, students rated themselves on a four-point scale--top 10%, above average, average, and below average.

Table 2 summarizes the reliability coefficients (K-R 20) for all descriptive scales and indicates the number of items in each scale. Generally, the scales possess moderate to high homogeneity. Scales with low coefficients are usually brief scales or scales with marked heterogeneity of content.

Table 2

Kuder-Richardson Reliabilities for the Descriptive Scales of the American College Survey

Scale	No. of Items		Reliability	
	Men	Women	Men	Women
1. Realistic	14	14	.85	.77
2. Intellectual	14	14	.89	.89
3. Social	14	14	.84	.82
4. Conventional	14	14	.87	.83
5. Enterprising	14	14	.83	.76
6. Artistic	14	14	.88	.88
7. Self-Control	14	14	.86	.85
8. Aggressive	14	14	.84	.83
9. Masculine	14	14	.57	.50
10. Status	14	14	.71	.60
11. Acquiescence	30	30	.76	.76
12. Leadership Potential	29	20	.86	.77
13. Literary Potential	18	20	.84	.72
14. Artistic Potential	20	24	.79	.85
15. Scientific Potential	23	24	.81	.80
16. Musical Potential	18	21	.87	.74
17. Dramatic Arts Potential	18	23	.77	.82
18. Range of Experience	76	76	.92	.90
19. Intellectual Home Resources	39	39	.81	.78
20. Scientific Achievement	15	15	.80	.81
21. Leadership Achievement	14	14	.72	.65
22. Dramatic Arts Achievement	13	13	.75	.72
23. Artistic Achievement	12	12	.84	.81
24. Literary Achievement	8	8	.73	.70
25. Musical Achievement	15	15	.84	.77

Table 2 (cont.)

Scale	No. of Items		Reliability	
	Men	Women	Men	Women
26. Total Competencies	143	143	.94	.93
27. Scientific Competency	11	11	.70	.67
28. Technical Competency	23	23	.83	.76
29. Government & Social Studies Competency	2	2	.57	.54
30. Athletic Competency	11	11	.71	.70
31. Business & Clerical Competency	5	5	.48	.38
32. Social & Educational Competency	13	13	.78	.74
33. Homemaking Competency	24	24	.86	.85
34. Arts Competency	34	34	.87	.85
35. Leadership & Sales Competency	12	12	.80	.79
36. Foreign Language Competency	6	6	.35	.11
37. Preconscious Activity (Originality)	38	38	.72	.68
38. Dogmatism	40	40	.77	.75
39. Academic Type	10	10	.45	.42
40. Vocational Type	10	10	.39	.36
41. Non-Conformist Type	10	10	.42	.43
42. Collegiate Type	10	10	.45	.50
43. Interpersonal Competency	20	20	.69	.67

Note.--This table is based on the total student samples of 6,289 men and 6,143 women.

Vocations and Their Prospective Recruits

The vocational choices and the number of students planning to enter each vocation are shown in Table 3. Vocations with less than 10 prospective students were eliminated from further study. Similarly, students who were undecided or gave no response or unclassifiable responses were omitted.

Table 3

The Distribution of Students by Anticipated Vocational Choice

Vocational Choice	Men	Women	Vocational Choice	Men	Women
Accounting	279	42	English, Creative Writing	42	52
Administration & Supervision	8	2	English Education	67	306
Aeronautical Engineering	77	9	Experimental & General Psych.	23	12
Agricultural Science	166	15			
Anthropology	12	2	Farming	61	3
Architecture	83	8	Finance	91	7
Art	45	92	Foreign Language Education	17	117
Art Education	29	93	Foreign Service	35	36
Astronomy, astrophysics	14	6	Forestry	105	1
			General Humanities	11	8
Bio-chemistry	15	12	General Social Sciences	8	8
Biology	55	40	Geography	12	4
Botany	12	3	Geology, geophysics	19	3
Business Education	23	89			
			History	57	24
Chemical Engineering	94	2	History Education	202	154
Chemistry	87	25	Home Economics	5	184
Civil Engineering	185	6	Home Economics Education	3	153
Clerical	6	94	Housewife	0	122
Clinical Psychology	42	48			
Counseling & Guidance	36	76	Industrial Arts Education	50	1
			Industrial Engineering	37	0
Dentistry	120	32	Industrial & personnel psychology	17	8
Drama	19	18			
			Journalism, Radio-TV, Communication	58	57
Economics	14	4			
Education, General and Other	22	29			
Education of Exceptional Children	8	145			
Educational Psychology	9	15			
Electrical Engineering	259	4			
Elementary Education	117	1497			
Engineering, General and Other	65	2			
Engineering Science	44	4			

Table 3 (cont.)

Vocational Choice	Men	Women	Vocational Choice	Men	Women
Law	288	32	Other Health Fields	14	51
Library Science	6	32			
Literature	10	22	Pharmacy	51	15
			Philosophy	10	2
Management	360	22	Physical Education,		
Marketing	45	5	Recreation, Health	272	239
Mathematics,			Physical Science,		
Statistics	80	54	General and Other	5	0
Math Education	138	114	Physical Therapy	9	32
Mechanical			Physics	61	7
Engineering	152	1	Physiology	12	6
Medical Technology	9	111	Political Science	76	32
Medicine	354	79	Public Administration	19	4
Metallurgical					
Engineering	14	0	Public Relations,		
Metallurgy	0	1	Advertising	40	13
Meteorology	3	2	Purchasing	16	55
Military Science	80	0			
Modern Foreign			Sales	64	25
Language	6	42	Secretarial		
Music	41	43	Science	3	267
Music Education	63	74	Social Work	19	140
			Sociology	15	34
Natural Science			Speech	10	22
Education	86	45			
No near equivalent			Theology, religion	77	34
in list	181	139	Trade & Industrial		
Not full-time & not			Education	27	0
housewife	2	6			
Nursing	4	301	Undecided or don't		
			know	451	295
Oceanography	9	1			
Other Biological			Veterinary		
Sciences	36	21	Medicine	120	16
Other Business &					
Commercial	39	9	Zoology	33	13
Other Fine & Applied					
Arts	10	11			

Note.--Samples of less than 10 for either sex were not used for this study; categories which do not represent specific fields were also omitted: "undecided, no near equivalent in list."

For each vocation selected by 10 or more students (76 vocations for men; 58 vocations for women) the mean and standard deviation were computed for 117 student characteristics. The student characteristics were assumed to differentiate among the vocational choices. A partial test of this assumption was made by computing simple analyses of variance for 53 of the 117 student variables; statistically significant results were obtained for both sexes for 52 of these 53 variables. Only the self-rating of "self-sufficiency" failed to differentiate among choices of vocation.

Since the statistically significant findings are so extensive, we are reporting only the most distinctive findings. Accordingly, the vocations with the highest and lowest means on each of the 117 characteristics were identified. A summary of these distinctive characteristics was prepared for each vocational choice. In the following tables, a "high" variable listed for a group is the student variable with the highest average score among the average scores for all 76 male or 58 female vocational choices. For example, in the Physical Sciences, the highest average score on scientific achievement (variable 20) is for men whose vocational choice is physics; the groups of men selecting the remaining 75 vocational choices have lower average scores for scientific achievement. The "low" variables listed for each group of vocational choices are those student variables with the lowest average score among the average scores for all 76 male or 58 female choices of vocation. Accordingly, the "high" variables should be interpreted as the positive poles of the scales

or ratings, and the scale name indicates the interpretation. For example, "High: Science Achievement" means many scientific achievements, "High: Dogmatism" means very dogmatic. Similarly, "Low: Science Achievement" means few scientific achievements.

The vocational choices for our student sample were then grouped into 13 conventional areas: physical sciences, biological sciences, humanities, social sciences, agriculture, business and administration, education, political science and law, health professions, engineering, creative arts, vocational and trade, and military science. The characteristics which were the most descriptive of the students with vocational choices in these areas were tabulated.

The characteristics of students planning to enter the various fields are summarized in Tables 4 through 16. Each table combines the characteristics of several related vocational choices. While a given entry in a table applies only to a single vocation in the group, it is assumed that the classification scheme is sufficiently homogeneous to permit generalization to all vocations in the group. Since this assumption is not always tenable, a problem which most a priori classifications face, the following descriptions contain some inappropriate classifications and concomitant descriptive error.

Physical Sciences (astronomy, astrophysics, chemistry, physics, geography, geology, geo-physics, mathematics, and statistics)

Men planning a scientific vocation are high on science achievement and dogmatism. They rate themselves as being high on mathematical and

scientific ability. Important goals for these future scientists include inventing or developing a useful product or device, being an authority on a special subject in their field, making their parents proud, and keeping in good physical condition. Finding a suitable mate is also important to them.

These future scientists have relatively few intellectual home resources, score low on interpersonal competency. They tend not to date or to date different persons rather than go steady or be engaged or married. They rate themselves as being low on leadership, aggressiveness, writing ability, cheerfulness, and perseverance. Goals that are relatively unimportant to these future male scientists include helping others who are in difficulty, being influential in public affairs, following a formal religious code, being a good parent, and finding a real purpose in life.

Compared to the rather complete description of the male, one finds few distinctive characteristics for the female scientist, perhaps because few women in our sample plan to enter scientific vocations. The women rate themselves high on mathematical ability and scholarship. An important goal to them is being self-sufficient. They have few social and educational competencies and relatively few have consulted with a professional person about a personal problem.

Table 4

Student Characteristics associated with

the Choice of Physical Sciences

Men	Women
High Means	
SR - mathematical ability	SR - mathematical ability
Science Achievement	SR - scholarship
Dogmatism	G - self-sufficient
SR - scientific ability	
G - inventing or developing a useful product or device	
G - making parents proud	
G - authority on special subject in my field	
G - good physical condition	
Importance of Finding Suitable Mate	
Low Means	
Intellectual Home Resources	Social and Educational Competency
Interpersonal Competency	Consultation with Professional Person
SR - leadership	
SR - aggressiveness	
SR - writing ability	
SR - cheerfulness	
SR - perseverance	
G - helping others who are in difficulty	
G - influential in public affairs	
G - following formal religious code	
G - good parent	
G - finding real purpose in life	
Psycho-Sexual Status	

Biological Sciences (biology, bio-chemistry, botany, physiology, zoology, other biological science fields)

The men and women planning biological vocations have the following traits in common: They are high on intellectual interests and science competency. They are low on enterprising interests and leadership

potential. Important goals for them are making theoretical and technical contributions to science. Unimportant goals are being an expert in finance and commerce and avoiding hard work.

In addition, the men have a need for achievement, but say they are conservative and passive. They have little potential in the fine arts, and are not adept in social or homemaking situations. Compared to other students, they are less interested in being self-sufficient, a finding that is somewhat surprising but in line with their other traits.

On the other hand, the women are high on most of the variables dealing with science, including ability, potential, and achievement. They appear to have a need for acceptance. They are not adept in interpersonal relationships and have relatively little interest in community affairs or politics.

An over-all view of these men and women who plan to pursue a biological science vocation reveals that, although there are some similarities between the men and the women, there are many more differences. Interestingly enough, the women planning to enter a biological science vocation are more like the men planning to enter a physical science vocation.

Table 5

Student Characteristics associated with

the Choice of Biological Sciences

High Means	
Men	Women
Intellectual (VPI)	Intellectual (VPI)
Scientific Competency	Scientific Competency

Table 5 (cont.)

High Means

Men	Women
G - theoretical contribution to science	G - theoretical contribution to science
G - technical contribution to science	G - technical contribution to science
SR - drive to achieve	Scientific Potential
SR - conservatism	Scientific Achievement
	Expected Vocational Achievement
	SR - scientific ability
	SR - research ability
	SR - physical health
	G - inventing, developing useful product or device
	G - authority on special subject in my field
	G - making parents proud
	G - mature and well-adjusted person
	G - being well-liked
	G - good spouse
	G - good parent
	G - finding real purpose in life

Low Means

Men	Women
Enterprising (VPI)	Enterprising (VPI)
Leadership Potential	Leadership Potential
G - expert in finance and commerce	G - expert in finance and commerce
G - avoiding hard work	G - avoiding hard work
Aggressive (VPI)	Total Competencies
Artistic Potential	Athletic Competency
Dramatic Arts Potential	Interpersonal Competency
Social & Educational Competency	SR - understanding of others
Homemaking Competency	SR - writing ability
SR - sociability	SR - cheerfulness
SR - self-control	G - becoming a community leader
SR - expressiveness	G - becoming influential in public affairs
SR - social self-confidence	G - keeping up-to-date politically
SR - popularity with opposite sex	G - successful in own business
G - self-sufficient	Importance of Finding Suitable Mate

Engineering (civil, chemical, electrical, industrial, mechanical, metallurgical, engineering science, general engineering)

As there were not enough women (less than 10) seeking any of the engineering fields, the following findings are concerned only with the men who are planning to enter this area. They have masculine interests and are technically and mechanically oriented. They have few social interests and indicate little potential or achievement in the arts. They rate themselves low on originality and speaking ability, and do not aspire to education beyond the bachelor's degree.

In general, the potential engineer seems to be a he-man type with technical and mechanical skills, who disdains the cultural and creative aspects of life.

Table 6

Student Characteristics associated with the Choice of Engineering

High Means (Male)
Masculine (VPI)
Scientific Potential
Technical Competency
Vocational Type
SR - mechanical ability

Low Means (Male)
Social (VPI)
Musical Potential
Literary Achievement
Musical Achievement
Government & Social Studies Competency
Highest Level of Education
SR - originality
SR - speaking ability

Table 6 (cont.)

Low Means (Male)
G - accomplished in performing arts
G - writing good fiction
G - becoming accomplished musician

Health Professions (dentistry, medicine, nursing, pharmacy, physical therapy, veterinary medicine, medical technology, other health fields)

The men are high on total competencies, expected income, satisfaction with college choice, and consultation with a professional person. An important goal for these future medical practitioners is being successful in their own business. Unimportant goals are being well-read and being up-to-date politically.

The women have realistic and masculine interests, which are reflected in their athletic, technical and mechanical abilities. They have a need for achievement, say they are self-controlled and practical-minded, and are relatively dogmatic. They show little interest in creative work.

Significantly, the men and women planning to enter the medical profession have no traits, self-ratings, or goals in common. Consequently, men planning to become doctors or dentists seem quite unlike the women who plan to be nurses, veterinarians, or medical technicians. The women seem to have more in common with the male engineers.

Table 7

Student Characteristics associated with

the Choice of Health Professions

High Means	
Men	Women
Total Competencies	Realistic (VPI)
Expected Income	Masculine (VPI)
G - successful in own business	Technical Competency
Satisfaction with College Choice	Athletic Competency
Consultation with Professional Person	Dogmatism
	Vocational Type
	SR - mechanical ability
	SR - drive to achieve
	SR - self-control
	SR - practical mindedness

Low Means	
Men	Women
G - being well-read	Self-Control (VPI)
G - up-to-date politically	Literary Achievement
	SR - intellectual self-confidence
	SR - sense of humor
	G - helping others who are in difficulty
	G - writing good fiction
	G - obtaining awards or recognition
	G - producing good artistic work
	G - exciting and stimulating activities

Agriculture (farming, forestry, agricultural science)

The men are not high on any of the 117 variables studied. They have relatively little interest in artistic or prestigious activities. They come from the smaller, rural high schools. They don't think that engaging in exciting and stimulating activities is important to them.

The women have a relatively wide range of experience and are satisfied with their college. They are low on many social variables, such

as status, sociability, and popularity with the opposite sex.

There is insufficient evidence to make generalizations about these students planning an agricultural vocation. It would appear, however, that they tend to come from the small rural school and frequently are following family tradition.

Table 8

Student Characteristics associated with

the Choice of Agriculture

Men	Women
High Means	
	Range of Experience
	Satisfaction with College Choice
Low Means	
Status (VPI)	Status (VPI)
Artistic (VPI)	Social (VPI)
Foreign Language Competency	Leadership and Sales Competency
G - exciting and stimulating activities	SR - sociability
	SR - social self-confidence
Size of High School Class	SR - popularity with opposite sex
	G - mature and well-adjusted person
	G - self-sufficient

Education (elementary, English, foreign language, history, natural science, mathematics, physical education, health, recreation, exceptional children, general education, other)

The men and women in this subgroup rate themselves high on athletic ability and physical energy and being an outstanding athlete is an important goal. The women are also high on the goal of keeping in good physical condition.

In addition, the men have a relatively narrow range of experience and few athletic competencies. They show little interest in the following goals: being happy and content, inventing or developing a useful product or device, having a meaningful philosophy of life, and producing good artistic work. The women, on the other hand, are low on the self-ratings of understanding of others and popularity with the opposite sex.

Table 9

Student Characteristics associated with

the Choice of Education Professions

High Means	
Men	Women
SR - athletic ability	SR - athletic ability
SR - physical energy	SR - physical energy
G - outstanding athlete	G - outstanding athlete
	G - good physical condition
Low Means	
Men	Women
Range of Experience	SR - understanding of others
Athletic Competency	SR - popularity with opposite sex
G - happy and content	
G - inventing, developing useful product	
G - meaningful philosophy	
G - good artistic work	

Social Science (counseling and guidance, educational psychology, clinical psychology, industrial and personnel psychology, experimental and general psychology, anthropology, sociology, and social work)

These future social scientists are high on social interests and size of the high school graduating class. They rate themselves high on sensi-

tivity to the needs of others. They do not anticipate outstanding vocational achievement and being well-liked is relatively unimportant.

In addition to the above characteristics, the men are status-seeking, have a wide range of experience, and have many intellectual home resources. They are persevering, have few conventional interests, and have little athletic ability or physical energy. They are less independent than others, but making their parents proud of them is not an essential goal.

The women are acquiescent, understand others, and have a sense of humor. They have a wide range of competencies, but little self-control and poor physical health. They expect to make a considerable amount of money after they have graduated. They are not musically inclined.

In general, these future social scientists are socially oriented, interested in others, and from urban areas.

Table 10

Student Characteristics associated with

the Choice of Social Sciences

High Means	
Men	Women
Social (VPI)	Social (VPI)
SR - sensitivity to the needs of others	SR - sensitivity to the needs of others
Size of High School Class	Size of High School Class
Status (VPI)	Acquiescence (VPI)
Range of Experience	Total Competencies
Intellectual Home Resources	Expected Income
SR - perseverance	SR - understanding of others

Table 10 (cont.)

High Means	
Men	Women
	SR - sense of humor
Low Means	
Men	Women
Expected Vocational Achievement	Expected Vocational Achievement
G - being well-liked	G - being well-liked
Conventional (VPI)	SR - self-control
Dramatic Arts Achievement	SR - physical health
Business and Clerical Competency	G - accomplished musician
SR - athletic ability	
SR - independence	
SR - physical energy	
G - authority on special subject in my field	
G - making parents proud	
G - active in religious affairs	
G - successful in own business	

Vocational and Trade (home economics education, business education, trade and industrial education, industrial arts education, library science, home economics, housewife)

The men in this group have realistic interests, are acquiescent, and want to be good husbands. Compared to others, they are less skilled as leaders, writers, or artists. They are less sensitive to the needs of others, and have less confidence in their intellectual abilities.

The women are skilled homemakers, and wish to be good wives and parents. They are less skilled as leaders or athletes, and consider themselves less popular than others. They have little fine arts or scientific potential, and are not interested in being an authority on a special subject in their field.

From Table 11, one gets a fairly complete representation of the women planning to enter the vocational and trade vocations, while the information concerning the men is somewhat sparse. Since only three variables are common to males and females, this suggests that the present group of vocations is a heterogeneous one. Further, perhaps men and women need separate classification schemes.

Table 11

Student Characteristics associated with

Vocational and Trade Choices

High Means

Men	Women
G - good spouse	G - good spouse
Realistic (VPI)	Homemaking Competency
Acquiescence (VPI)	G - good parent
	Psycho-Sexual Status
	Finding Suitable Mate

Low Means

Men	Women
Literary Potential	Literary Potential
Leadership Achievement	Leadership Achievement
Total Competencies	Artistic Potential
Arts Competency	Scientific Potential
Leadership & Sales Competency	Dramatic Arts Potential
SR - intellectual self-confidence	Range of Experience
SR - sensitivity to the needs of others	Government & Social Studies Competency
	Foreign Language Competency
	Academic Type
	Non-Conformist Type
	SR - leadership
	SR - popularity with opposite sex
	SR - physical energy
	G - authority on special subject in my field

Table 11 (cont.)

Low Means	
Men	Women
	G - making parents proud Size of High School Class

Business and Administration (management, clerical, sales, finance, marketing, purchasing, economics, public relations, advertising, accounting, public administration, secretarial science, other business and commercial fields)

The men and women in this area have the following in common: They have conventional and enterprising interests. They want to be well-off financially, to be an expert in finance and commerce, and to have executive responsibility for the work of others. Compared with students in other fields, they are less intellectual, scientific, artistic, dramatic, and original.

In addition, the men are leaders and athletes, who see themselves as aggressive, independent, and practical-minded. They want to have the time and means to relax and enjoy life, they want to be mature and well-adjusted, and they want to be well-liked. On the other hand, they have many homemaking skills, they are not academic types, are less satisfied with their choice of college, and have rarely consulted with a professional person about their personal problems.

The women are competent on business and clerical skills, and on leadership and sales. They want to make their parents proud, to be religious, to be good parents, to avoid hard work, and to be successful

in their own business. They have few realistic or artistic interests and are less acquiescent than other students. Their interest and achievement in scientific, musical, or dramatic activities is low.

The data shown in Table 12 clearly depicts the people who plan to enter business and administrative positions. Generally, these findings are consonant with our conception of the businessman or the administrator. Possibly the sex differences occur because more women are planning for secretarial, clerical, or sales positions, while men are looking towards higher level positions in management, finance, and accounting.

Table 12

Student Characteristics associated with the Choice of Business and Administration

High Means	
Men	Women
Conventional (VPI)	Conventional (VPI)
Enterprising (VPI)	Enterprising (VPI)
G - well-off financially	G - well-off financially
G - expert in finance and commerce	G - expert in finance and commerce
G - executive responsibility	G - executive responsibility
Aggressive (VPI)	Business and Clerical Competency
Leadership Achievement	Leadership and Sales Competency
Athletic Competency	G - making parents proud
Homemaking Competency	G - formal religious code
SR - aggressiveness	G - good parent
SR - independence	G - avoiding hard work
SR - practical-mindedness	G - successful in own business
G - relaxing and enjoying life	
G - mature and well-adjusted	
G - being well-liked	

Table 12 (cont.)

Low Means

Men	Women
Intellectual (VPI)	Intellectual (VPI)
Scientific Achievement	Scientific Achievement
Artistic Achievement	Artistic Achievement
Preconscious Activity	Preconscious Activity
SR - acting ability	SR - acting ability
Academic Type	Realistic (VPI)
SR - scholarship	Artistic (VPI)
G - helping others who are in difficulty	Acquiescence (VPI)
G - making sacrifices for others	Musical Potential
G - following formal religious code	Intellectual Home Resources
G - accomplished musician	Dramatic Arts Achievement
Satisfaction with College Choice	Arts Competency
Consultation with Professional Person	SR - drive to achieve
	SR - speaking ability
	SR - artistic ability
	SR - scientific ability
	SR - expressiveness
	SR - research ability
	G - accomplished in performing arts
	G - technical contribution to science
	G - being well-read
	G - real purpose in life

Political Science (political science, law, foreign service)

Both men and women in this area are high on the goals of being influential in public affairs and keeping up-to-date politically. The men appear on only one other variable, being high on highest level of education.

The women, on the other hand, are aggressive, social, independent, and leaders. Their interpersonal relationships are good. They want to make their parents proud, to become community leaders, to find a real purpose in life, and to engage in exciting and stimulating activities. They are not musical, scientific, or homemakers.

Thus, a fairly good picture of the women planning this vocation emerges, but there is little evidence about the men.

Table 13

Student Characteristics associated with

the Choice of Political Science, Law, or Foreign Service

High Means	
Men	Women
G - influential in public affairs	G - influential in public affairs
G - up-to-date politically	G - up-to-date politically
Highest Level of Education	Aggressive (VPI)
	Status (VPI)
	Leadership Potential
	Leadership Achievement
	Interpersonal Competency
	SR - sociability
	SR - aggressiveness
	SR - independence
	G - making parents proud
	G - becoming a community leader
	G - finding real purpose in life
	G - engaging in exciting and stimulating activities
Low Means	
Men	Women
	Musical Achievement
	Scientific Competency
	Technical Competency
	Homemaking Competency
	G - inventing or developing a useful product or device
	Psycho-Sexual Status

Creative Arts (art, speech, music education, art education, drama, literature, English, creative writing, music, journalism, other fine and applied arts)

The men and women planning to enter the creative arts have more

variables in common than any other group. They are, for example, both high on literary, artistic, musical, and dramatic arts potential; literary, artistic, musical, and dramatic arts achievement; artistic, social and educational competency; and academic and collegiate type. They are original, expressive, cheerful, socially self-confident, feminine, and not conservative. They also have in common many goals and self-ratings, both high and low, that reinforce one's characterization of the kinds of people that would be in the creative arts vocations.

Furthermore, Table 14 indicates that these men and women are high or low on many other variables, in addition to those that are in common. Not only do men and women in creative arts have more variables in common than any other group, they are also either high or low on more variables than any other group. In addition, they usually obtain more high than low scores.

These results imply that people planning to enter this vocational area are individualistic, egotistical people who are not afraid of being extreme, people who do not want to be thought of as average or common.

Table 14

Student Characteristics associated with

the Choice of Creative Arts

High Means	
Men	Women
Literary Potential	Literary Potential
Artistic Potential	Artistic Potential
Musical Potential	Musical Potential
Dramatic Arts Potential	Dramatic Arts Potential
Dramatic Arts Achievement	Dramatic Arts Achievement

Table 14 (cont.)

High Means

Men	Women
Artistic Achievement	Artistic Achievement
Literary Achievement	Literary Achievement
Musical Achievement	Musical Achievement
Social & Educational Competency	Social & Educational Competency
Arts Competency	Arts Competency
Academic Type	Academic Type
Collegiate Type	Collegiate Type
SR - originality	SR - originality
SR - writing ability	SR - writing ability
SR - expressiveness	SR - expressiveness
SR - cheerfulness	SR - cheerfulness
SR - social self-confidence	SR - social self-confidence
SR - acting ability	SR - acting ability
G - accomplished performer	G - accomplished performer
G - writing good fiction	G - writing good fiction
G - being well-read	G - being well-read
G - awards or recognition	G - awards or recognition
G - good artistic work	G - good artistic work
G - accomplished musician	G - accomplished musician
G - good parent	G - good parent
G - finding real purpose in life	G - finding real purpose in life
Self-Control (VPI)	Artistic (VPI)
Leadership Potential	Intellectual Home Resources
Interpersonal Competency	Preconscious Activity
SR - sociability	Non-Conformist Type
SR - self-control	SR - leadership
SR - sense of humor	SR - popularity
G - happy and content	SR - artistic ability
G - meaningful philosophy	SR - speaking ability
G - formal religious code	SR - intellectual self-confidence
G - self-sufficient	SR - popularity with opposite sex
G - avoiding hard work	G - good spouse
G - exciting and stimulating activities	
Psycho-Sexual Status	

Table 14 (cont.)

Low Means

Men	Women
Masculine (VPI)	Masculine (VPI)
SR - mechanical ability	SR - mechanical ability
SR - conservatism	SR - conservatism
G - outstanding athlete	G - outstanding athlete
G - theoretical contribution to science	G - theoretical contribution to science
G - technical contribution to science	G - technical contribution to science
G - executive responsibility	G - executive responsibility
Satisfaction with College Choice	Satisfaction with College Choice
Conventional (VPI)	Aggressive (VPI)
Acquiescence (VPI)	Athletic Competency
Scientific Potential	Business and Clerical Competency
Scientific Competency	Dogmatism
Technical Competency	Vocational Type
SR - understanding of others	SR - scholarship
SR - mathematical ability	SR - aggressiveness
SR - scientific ability	SR - practical-mindedness
SR - research ability	SR - physical energy
G - influential in public affairs	G - sacrifices for others
G - mature and well-adjusted person	G - formal religious code
	G - good physical condition
Importance of Finding Suitable Mate	G - active in religious affairs

Humanities (history, modern foreign language, philosophy, architecture, theology, religion, general humanities)

The men and women in this area are high on governmental, social studies, and language competencies, the goals of helping others, making sacrifices for others, and being active religiously. They are low on collegiate type, expected income, and on the goal of being well-off financially.

In addition, the men are artistic, original, scholarly, intellectually self-confident, popular with the opposite sex, and leaders. They have

few realistic interests and are not of the vocational type. They have little drive to achieve, are not practical-minded, have little sense of humor, their physical health is below average, and they are less dogmatic than other groups. They are not socially oriented, have less need for recognition, and do not mind hard work.

The women are self-controlled and conservative. They have few conventional interests and rate themselves low on originality and mathematical ability. The women do not appear as high or low on enough variables to make any reliable generalizations.

Table 15

Student Characteristics associated with

the Choice of Humanities

High Means	
Men	Women
Government and Social Studies Competency	Government and Social Studies Competency
Foreign Language Competency	Foreign Language Competency
G - helping others	G - helping others
G - sacrifices for others	G - sacrifices for others
G - active religiously	G - active religiously
Artistic (VPI)	Self-Control (VPI)
Business and Clerical Competency	SR - conservatism
Leadership and Sales Competency	Consultation with Professional Person
Preconscious Activity	
SR - leadership	
SR - understanding of others	
SR - scholarship	
SR - speaking ability	
SR - intellectual self-confidence	
SR - popularity with opposite sex	
SR - research ability	

Table 15 (cont.)

Low Means

Men	Women
Collegiate Type	Collegiate Type
Expected Income	Expected Income
G - well-off financially	G - well-off financially
Realistic (VPI)	Conventional (VPI)
Dogmatism	SR - originality
Vocational Type	SR - mathematical ability
SR - drive to achieve	
SR - practical-mindedness	
SR - sense of humor	
SR - physical health	
G - relaxing and enjoying life	
G - awards or recognition	
G - good physical condition	
G - good spouse	
G - avoiding hard work	
G - exciting activities	

Military Science

The men in this vocational area appear on only one variable--that of being low on self-control.

Table 16

Student Characteristics associated with the Choice of Military Science

High Means (Men)
(none)

Low Means (Men)
Self-Control (VPI)

Individual Vocational Choice

Since many people will be more interested in the individual vocational choices (vocation by vocation) rather than in the data for groups

of vocational choices, Table 17 identifies the vocational choice that is highest and lowest on each of the 117 variables for both men and women. For example, on Realistic (variable 1, skilled and technical interests), industrial arts education is high for men and veterinary medicine is high for women; men in general humanities and women in management are low on this variable.

Table 17

The Vocational Choices with the Highest and Lowest Mean Scores on 117 Variables

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
1. Realistic	Ind. Arts Education	Gen. Humanities	Vet. Medic.	Management
2. Intellectual	Bio-chem.	Sales	Bio-chem.	Sales
3. Social	Counseling & Guidance	Metal. Engr'ng	Educ'l Psychology	Ag. Science
4. Conventional	Accounting	Art Ed.; Anthro.	Accounting	Theology, Religion
5. Enterprising	Marketing	Botany	Sales	Bio-chem.
6. Artistic	Philosophy	Farming	Drama	Accounting
7. Self-Control	Other Fine & Appl. Arts	Military Science	Theology, Religion	Vet. Medicine
8. Aggressive	Public Admin.	Botany	Law	Other Fine & Applied Arts
9. Masculine	Engr'ng, Gen. & Other	Art Educ.	Vet. Medic.	Art Educ.
10. Status	Counseling & Guidance	Farming	Law	Ag. Science
11. Acquiescence	Ind. Arts Education	Literature	Exp. & General Psych.	Management
12. Leadership Potential	Speech	Botany	Political Science	Other Biol. Sciences
13. Literary Potential	English, Creat. Wrtg	Trade & Indust'l Ed.	English, Creat. Wrtg	Business Education
14. Artistic Potential	Art	Botany	Art Educ.	Business Education

Table 17 (cont.)

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
15. Scientific Potential	Engr'ng Science	Art Educ.	Bio-chem.	Business Education
16. Musical Potential	Music Education	Metall. Engr'ng	Music Education	Management
17. Dramatic Arts Pot'l	Speech	Botany	English, Creat. Wrtg	Business Education
18. Range of Experience	Exp. & General Psych.	Math. Educ.	Ag. Science	Business Education
19. Intellectual Home Resources	Anthropology	Geography	Other Fine & Applied Arts	Accounting
20. Scientific Achieve't	Astronomy, Astrophysics	Purchasing	Bio-chem.	Sales
21. Leadership Achieve't	Public Admin.	Trade & Indust'l Ed.	Law	Library Science
22. Dramatic Arts Ach.	Drama	Sociology	Drama	Accounting
23. Artistic Achieve't	Art	Finance	Art Educ.	Accounting
24. Literary Achieve't	English, Creat. Wrtg	Metall. Engr'ng	English, Creat. Wrtg	Dentistry
25. Musical Achieve't	Music	Metall. Engr'ng	Music	Foreign Service
26. Total Competencies	Other Health Fields	Trade & Indust'l Ed.	Educ'l Psychology	Other Biol. Sciences
27. Scientific Competency	Zoology	Music Educ.	Zoology	Foreign Service
28. Technical Comp.	Indust'l Engr'ng	Literature	Vet. Medic.	Foreign Service
29. Gov't & Soc. St. Comp.	Philosophy	Metall. Engr'ng	History	Business Education
30. Athletic Comp.	Public Admin.	Foreign Lang. Educ.	Vet. Medic.	Biology; Music Educ.
31. Business & Clerical Comp.	Philosophy	Indust'l & Personnel Psychology	Public Relations	Art
32. Social & Ed. Comp.	Drama	Botany	Drama	Chemistry
33. Homemaking Comp.	Purchasing	Bio-chem.	Home Econ. Education	Foreign Service

Table 17 (cont.)

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
34. Arts Comp.	Drama	Trade & Indust'l Ed.	Drama	Accounting
35. Leadership & Sales Comp.	Philosophy	Trade & Indust'l Ed.	Public Relations	Ag. Science
36. Foreign Lang. Comp.	Philosophy	Farming	Mod. Foreign Lang.	Business Education
37. Precon-scious Act.	Philosophy	Accounting	Drama	Accounting
38. Dogmatism	Geography	Philosophy	Pharmacy	Literature
39. Academic Type	Literature	Finance	Literature	Housewife
40. Vocational Type	Metall. Engr'ng	General Humanities	Pharmacy	Literature
41. Non-conf. Type	Philosophy	Theology, Religion	Literature	Home Econ.
42. Collegiate Type	Speech	Philosophy	Speech	Theology, Religion
43. Interpersonal Comp.	Drama	Physics	Law	Bio-chem.
44. Expected Income	Medicine	Theology, Religion	Exp. & General Psych.	Theology, Religion
45. Expected Vocational Achievem't	Philosophy	Sociology	Bio-chem.	Educ'l Psychology
46. Highest Level of Education	Law	Indust'l Engr'ng	Clerical	Management
47. SR - originality	English, Creat. Wrtg	Metall. Engr'ng	English, Creat. Wrtg	History
48. SR - leadership	Philosophy	Astronomy, astrophysics	English, Creat. Wrtg	Library Science
49. SR - mechanical ability	Mech'l Engr'ng	Literature	Vet. Medic.	Drama
50. SR - popularity	Speech	Other Fine & Applied Arts	Speech	Library Science

Table 17 (cont.)

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
51. SR - athletic ability	Phys. Ed., Recreation	Social Work	Phys. Ed., Recreation	Library Science
52. SR - understanding of others	Philosophy	Other Fine & Applied Arts	Clinical Psychology	Other Biol. Sciences; Math Educ.
53. SR - drive to achieve	Bio-chem.	General Humanities	Medicine	Public Relations
54. SR - math ability	Math, Statistics	Literature	Math, Statistics	History
55. SR - scholarship	Philosophy	Purchasing	Math., Statistics	Art
56. SR - sociability	Speech	Botany	Foreign Service	Ag. Science
57. SR - artistic ability	Art Educ.	Speech	Art	Accounting
58. SR - aggressiveness	Marketing	Geography	Law	Other Fine & Applied Arts
59. SR - speaking ability	Philosophy	Metall. Engr'ng	Drama	Accounting
60. SR - self-control	Literature	Botany	Pharmacy	Exp. & General Psych.
61. SR - independence	Economics	Sociology	Law	Library Science
62. SR - scientific ability	Physics	Speech	Bio-chem.	Sales
63. SR - conservatism	Physiology	Other Fine & Applied Arts	Theology, Religion	Other Fine & Applied Arts
64. SR - practical-mindedness	Public Admin.	General Humanities	Pharmacy	Drama
65. SR - writing ability	English, Creat. Wrtg	Geography	English, Creat. Wrtg	Other Biol. Sciences
66. SR - expressiveness	English, Creat. Wrtg	Botany	English, Creat. Wrtg	Accounting
67. SR - cheerfulness	Speech	Astronomy, Astrophysics	Speech	Other Biol. Sciences
68. SR - social self-confidence	Speech	Botany	English, Creat. Wrtg	Ag. Science

Table 17 (cont.)

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
69. SR - intellectual self-confidence	Philosophy	Indus'l Arts Educ.	English, Creat. Wrtg	Pharmacy
70. SR - perseverance	Exp. & General Psych.	Geography	Medicine	Pharmacy
71. SR - popularity with opposite sex	Philosophy	Bio-chem.	English, Creat. Wrtg	Ag. Science; Educ., general & other; Library Science
72. SR - research ability	Philosophy	Speech	Zoology	Accounting
73. SR - physical energy	Phys. Ed., Recreation	Social Work	Phys. Ed., Recreation	Library Sci.; Other Fine & Appl. Arts
74. SR - sense of humor	Drama	General Humanities	Exp. & General Psych.	Pharmacy
75. SR - physical health	Other Fine & Applied Arts	General Humanities	Zoology	Educ'l Psychology
76. SR - acting ability	Drama	Purchasing	Drama	Accounting
77. SR - sensitivity to needs of others	Clinical Psychology	Trade & Indust'l Education	Zoology; Counseling & Guidance	Bio-chem.
78. G - happy and content	Speech	Foreign Lang. Educ.	Zoology	Bio-chem.
79. G - well-off financially	Public Relations	Theology, Religion	Public Relations	Theology, Religion
80. G - inventing useful product	Physics	English Education	Zoology	Poli. Sci.; Foreign Service
81. G - helping others	Theology, Religion	Astronomy, Astrophysics; Economics	Theology, Religion	Vet. Med.
82. G - accomplished performer	Drama	Metall. Engr'ng	Drama	Accounting
83. G - meaningful philosophy of life	Literature	Foreign Language Education	English, Creative Writing	Speech

Table 17 (cont.)

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
84. G - authority on special subject in field	Geology	Sociology	Zoology	Housewife
85. G - making parents proud	Geography	Anthropology	Zoology; Purchasing; Law	Library Science
86. G - outstanding athlete	Phys. Ed., Recreation	Music Educ.	Phys. Ed., Recreation	Literature
87. G - sacrifices for others	Theology, Religion	Economics	Theology, Religion	Literature
88. G - community leader	Speech	Literature	Political Science	Bio-chem.
89. G - influential in public affairs	Political Science	Astronomy, Astrophysics; Literature	Political Science	Bio-chem.
90. G - formal religious code	Speech	Astronomy, Astrophysics; Economics	Public Relations	English, Creat. Wrtg
91. G - relaxing & enjoy life	Public Admin.	Theology, Religion	Zoology	Bio-chem.
92. G - theoretical contrib. to science	Bio-chem.	Literature	Bio-chem.	Drama
93. G - technical con tribution to science	Bio-chem.	Literature	Bio-chem.	Sales; Drama
94. G - writing good fiction	English, Creat. Wrtg	Metall. Engr'ng	English, Creat. Wrtg	Dentistry
95. G - being well-read	Literature	Other Health Fields	Literature	Accounting
96. G - mature & well-adjusted	Public Admin.	Drama	Zoology	Agricultural Science
97. G - awards or recognition	Music	Theology, Religion	Drama	Other Health Fields

Table 17 (cont.)

Variable	Men		Women	
	Highest	Lowest	Highest	Lowest
98. G - self-sufficient	Literature	Botany	Chemistry	Ag. Science
99. G - good physical condition	Geography	Philosophy	Phys. Ed., Recreation	Literature
100. G - good art. work	Art Educ.	Math Educ.	Art Educ.	Veterinary Medicine
101. G - accomplished musician	Music	Metall. Engr'ng; Economics	Music	Educ'l Psychology
102. G - expert in finance & comm.	Finance	Zoology	Accounting	Zoology; Biology
103. G - up-to-date politically	Political Science	Other Health Fields	Political Science	Bio-chem.
104. G - being well-liked	Public Admin.	Anthropology	Zoology	Exp. & General Psych.
105. G - good spouse	Indust'l Arts Educ.	General Humanities	Other Fine & Applied Arts; Library Sci.; Zoology; Sociology	Exp. & General Psych.
106. G - good parent	Speech	Astronomy, Astrophysics	Zoology; Sociology; Accounting; Other Fine & Applied Arts; Lib. Science	Exp. & General Psych.
107. G - real purpose in life	Literature	Astronomy, Astrophysics	Zoology; Music; Law	Management
108. G - active religiously	Theology, Religion	Anthropology	Theology, Religion	Literature
109. G - executive responsibility	Public Admin.	Literature	Management	Drama
110. G - avoiding hard work	Speech	Bio-chem.; Philosophy	Public Relations	Zoology
111. G - exciting activities	Speech	Farming; Theology, Religion	Foreign Service	Pharmacy

Table 17 (cont.)

Variable		Men		Women	
		Highest	Lowest	Highest	Lowest
112.	G - success in own business	Dentistry	Anthropology	Sales	Bio-chem.
113.	Psycho-sexual status	Literature	Geography	Housewife	Political Science
114.	Satisfaction with College	Veterinary Medicine	Drama; Public Rel.	Ag. Science	Art
115.	Consultation with Prof'l Person	Other Health Fields	Economics	Theology, Religion	Math, Statistics
116.	Finding Suitable Mate	Astronomy, Astrophysics	Speech	Housewife	Other Biol. Sciences
117.	Size of High School Class	Indust'l & Personnel Psychology	Farming	Exp. & General Psych.	Home Econ. Education

Even a cursory review of Table 17 makes clear the finding that our vocational stereotypes have some validity. For example, on scientific achievement (variable 20), men in astronomy and astrophysics and women in biochemistry are high, and men in purchasing and women in sales are low. On the goal of having executive responsibility for the work of others (variable 109), men in public administration and women in management are high, and men in literature and women in drama are low.

Variation Among Vocational Choices

The student characteristics which distinguish most efficiently one vocational choice from another are important for the reasons that such knowledge reduces the number of student characteristics which we need to use in subsequent studies and identifies the descriptive variables which have the most practical value.

We determined those variables which had the greatest variation across the 76 male and 58 female vocational choices that had an N of at least 10. This variation was the range of vocational choice means divided by the standard deviation for the total population for each sex. Generally, those variables with the greatest variation across vocations were retained for a simple analysis of variance. Other variables, however, were added so that every kind of variable would be sampled. For example, several self-ratings, life goals, and achievement scales were tested for significance, although they were not among the variables showing the greatest variation.

Table 18 presents the results of these simple analyses of variance. Of the 53 variables studied, all but one are significant at the .01 level for both sexes and the last (G - self-sufficient) is significant at the .05 level for the male sample, but not the female.

Table 18

F-Tests for Selected Student Characteristics

Across Vocations

Variable	Men	Women
1. Realistic	8.6152	3.3414
2. Intellectual	15.0993	13.5548
3. Social	17.2490	10.6901
4. Conventional	20.9484	13.9858
5. Enterprising	15.2306	3.8965
6. Artistic	13.6045	7.9783
9. Masculine	15.3704	14.9835
10. Status	16.7917	6.0887
15. Scientific Potential	20.2207	10.6435
16. Musical Potential	15.0296	6.3862

Table 18 (cont.)

Variable	Men	Women
20. Scientific Achievement	6.9093	4.8959
21. Leadership Achievement	4.3493	2.9920
22. Dramatic Arts Achievement	5.1641	4.9564
23. Artistic Achievement	8.0012	15.5274
24. Literary Achievement	6.1372	8.5481
25. Musical Achievement	9.6659	7.2936
27. Scientific Competency	8.3534	9.4846
34. Arts Competency	8.8928	7.0871
35. Leadership & Sales Competency	5.4688	3.0564
36. Foreign Language Competency	6.0705	10.3257
37. Preconscious Activity	14.4343	11.9957
40. Vocational Type	5.9436	6.6956
41. Non-Conformist Type	3.2916	4.4867
44. Expected Income	16.1769	8.4112
46. Highest Level of Education	19.1990	11.0295
47. SR - originality	5.7809	7.7054
49. SR - mechanical ability	10.3847	4.3726
50. SR - popularity	3.2677	1.5627
51. SR - athletic ability	5.8798	8.6726
52. SR - understanding of others	3.1559	2.8306
54. SR - mathematical ability	18.8744	13.8174
57. SR - artistic ability	10.3715	14.8308
59. SR - speaking ability	6.6427	4.2949
60. SR - self-control	1.8272	1.6981
62. SR - scientific ability	22.8717	21.0032
63. SR - conservatism	1.7337	1.7500
65. SR - writing ability	6.5944	12.1985
72. SR - research ability	8.0025	6.4561
76. SR - acting ability	5.1694	4.7334
79. G - well-off financially	4.8257	2.3281
82. G - accomplished in performing arts	10.6115	11.7265
86. G - outstanding athlete	8.3338	12.6616
89. G - influential in public affairs	6.3362	3.8652
92. G - theoretical contribution to science	19.3678	14.8060
94. G - writing good fiction	10.3311	15.8997
98. G - self-sufficient	1.3683	1.2451
99. G - good physical condition	2.4971	2.4305
100. G - good artistic work	14.9475	20.8573

Table 18 (cont.)

Variable	Men	Women
101. G - accomplished musician	14.1473	16.7881
102. G - expert in finance and commerce	23.8636	7.5228
103. G - up-to-date politically	8.3265	4.0923
105. G - good spouse	1.7575	1.9383
108. G - active in religious affairs	4.9646	5.2307

Degrees of freedom
male: 76/5554
female: 58/5570

Significance levels
male: .05 = 1.28; .01 = 1.41
female: .05 = 1.32; .01 = 1.47

The results in Table 18 indicate that vocational interest variables consistently show the greatest variation among student vocational choices. Self-ratings and life goals show equally large variation, but such variables differentiate vocational choices less consistently.

Discussion

Several cautions should be observed in the interpretation of the results: Our students are aspirants for various vocations, they are not employed in occupations. The number of students with a given vocational choice varied from 10 to 1497, so that some characteristics are more reliable than others. Finally, the use of the highest and lowest mean scores of the descriptive variables accentuates the characterization of students in various fields. Every field probably contains many students who differ from the typical student.

The descriptions of students seeking different vocations imply, to a limited degree, that students know where they belong. They seek

vocations which are appropriate for their interests, values, and their special talents. Students with scientific accomplishments, abilities, and interests seek scientific vocations, and at the same time they avoid vocations which demand interpersonal competencies. Similar patterns of attraction and avoidance exist for most of the remaining areas of study.

These results also reveal that vocational decisions depend upon a great range of student characteristics: interests, values, self-conceptions, competencies, achievements, range of experience, and family resources. Therefore, students might be helped to choose a vocation by broad self-examination.

Since large proportions of students who say they plan to enter a vocation do enter that vocation, the present results may have some practical value (Strong, 1953). The descriptive variables are easily interpreted and are relatively free of psychological jargon. Perhaps just reading the present report would be helpful to some students. If such simple techniques were constructive, they could serve many students who cannot make use of guidance workers either because they dislike the idea itself, or because counseling staffs are too small to serve all students. Faculty advisors should also find a reading of the present report helpful in their advising.

The similarities between the present descriptive study of students who have selected a given vocation and the study of students who have selected a comparable field of study (Abe & Holland, 1965) are quite striking. The descriptions of prospective physical science majors and

of prospective physical scientists are almost identical (compare Table 4 in this study with Table 4 in the earlier study). Some readers will find it interesting to compare tables throughout both studies. Even the variation in descriptive variables is comparable in both studies (compare Table 18 in this study with Table 18 in the earlier study). Although we cannot say that the choice of major field is identical with the choice of vocation, our results strongly suggest a close association.

Generally, the descriptions of students seeking different vocations are consistent with related studies by Cooley (1963), Darley and Hagenah (1955), Davis (1964), Holland (1963), Roe (1956), and others. Since most studies do not group students in identical fashion, precise correspondence among studies is rare.

In new studies, we plan to develop psychological classification schemes which will be useful for practice and research. The current conventional classifications lack psychological homogeneity so that membership in a group frequently has diffuse and even conflicting meaning. Other studies will be performed to learn how students who persist in a field differ from students who leave a field. In these long term studies we will be able to determine the predictive validities of the assessment devices used in this first study as well as the influence of various college climates upon a student's choice of vocation.

References

Abe, C., & Holland, J. L. A description of college freshmen: I. Students who aspire to different major fields. Research Report No. 3. Iowa City: American College Testing Program, 1965.

Abe, C., Holland, J. L., Lutz, Sandra W., & Richards, J. M., Jr. A description of American college freshmen. Research Report No. 1. Iowa City: American College Testing Program, 1965.

Cooley, W. W. Career development of scientists. Cooperative Research Project No. 436, Office of Education, Graduate School of Education, Harvard Univer., 1963.

Darley, J. G., & Hagenah, Theda. Vocational interest measurement. Minneapolis: Univer. of Minnesota Press, 1955.

Davis, J. A. Great aspirations. Chicago: Aldine Publishing Co., 1964.

Farber, I. E., & Goodstein, L. D. Student orientation survey. Preliminary report, PHS research grant M-226, Univer. of Iowa, Iowa City, Iowa, 1964.

Foote, N. N., & Cottrell, L. S. Identity and interpersonal competencies. Chicago: Univer. of Chicago Press, 1955.

Holland, J. L. A personality inventory employing occupational titles. J. appl. Psychol., 1958, 42, 336-342.

Holland, J. L. Some explorations of a theory of vocational choice and achievement: II. A four-year prediction study. Psychol. Rep., 1963, 12, 545-594. Southern Universities Press, 1963, Monograph Suppl. 4-V12.

Holland, J. L., & Nichols, R. C. Prediction of academic and extra-curricular achievement in college. J. educ. Psychol., 1964, 55, 55-65.

Kubie, L. S. Neurotic distortion of the creative process. Lawrence, Kansas: Univer. of Kansas Press, 1958.

Nichols, R. C., & Holland, J. L. Prediction of the first year college performance of high aptitude students. Psychol. Monogr., 1963, 77, No. 7 (Whole No. 570).

Roe, Anne. The psychology of occupations. New York: Wiley, 1956.

Rokeach, M. Political and religious dogmatism, an alternative to the authoritarian personality. Psychol. Monogr., 1956, 70, No. 18 (Whole No. 425).

Strong, E. K., Jr. Validity of occupational choice. Educ. Psychol. Measmt, 1953, 13, 110-121.

Trow, M. The campus viewed as a culture. In H. T. Sprague (Ed.), Research on college students. Boulder, Colorado: Western Interstate Commission for Higher Education, 1960.